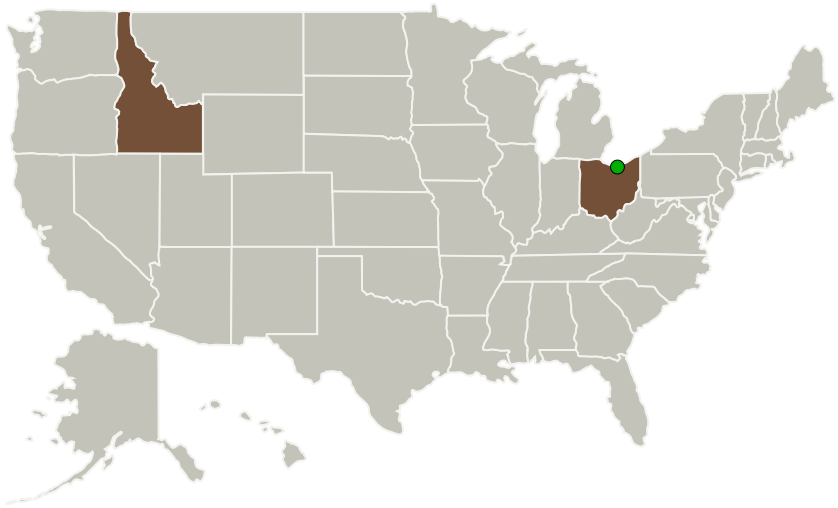
Radiation Hard Electronics for Advanced Communication Systems, Phase I

Completed Technology Project (2011 - 2011)

Project Introduction

Advanced reconfigurable/reprogrammable communication systems will require use of commercial sub 100 nm electronics. Legacy radiation tolerant circuits fail to provide Single Event Upset (SEU) immunity at speeds greater than 500 MHz. New base level logic circuits are needed to provide SEU immunity for high speed circuits afforded by sub 100 nm technology. A completely new circuit and system approach called Self Recovery Logic is proposed for development herein which is able to function at the full speed afforded by the fabrication process and able to tolerate SEU impacts not possible with legacy circuits. Moreover, a truly fault tolerant system is proposed which is projected to replace Triple Modular Redundancy as the on-chip means for fault tolerance. With the proposed building blocks in place, advanced reconfigurable and reprogrammable high speed devices can be implemented. A multiprocessor with advanced error correction and data compression capability is proposed for future development.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Integrated Computer Solutions	Lead Organization	Industry	
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

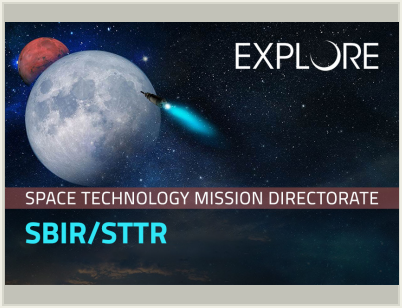


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Table of Contents

Radiation Hard Electronics for Advanced Communication Systems, Phase I

Completed Technology Project (2011 - 2011)

Primary U.S. Work Locations	
Idaho	Ohio

Project Transitions

February 2011: Project Start

August 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140158)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Integrated Computer Solutions

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Gary Maki

Co-Investigator:

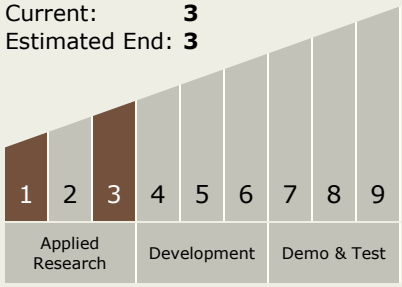
Gary Maki

Radiation Hard Electronics for Advanced Communication Systems, Phase I

Completed Technology Project (2011 - 2011)

Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.2 Radio Frequency
    - TX05.2.1 Spectrum-Efficiency

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System